

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) A fire fighting vehicle comprising:

(A) a chassis and a vehicle body mounted on the chassis, the chassis and vehicle body in combination including an operator compartment capable of receiving a human operator, the operator compartment including steering and throttle controls for receiving operator inputs to control movement of the fire fighting vehicle along a road;

(B) a turret including

(1) an adjustable mount assembly, the adjustable mount assembly being mounted to the chassis and vehicle body combination, and the mount assembly including a fire-extinguishing agent delivery system capable of transporting a fire-extinguishing agent through the mount assembly,

(2) a turret nozzle, the turret nozzle being mounted to the adjustable mount assembly, and the turret nozzle being capable of receiving the fire-extinguishing agent from the mount assembly;

(C) an operator interface, the operator interface being configured to receive operator inputs; and

(D) a turret control system, the turret control system including a plurality of actuators capable of adjusting the mount assembly to permit the position and orientation of the turret nozzle to be adjusted, the turret control system further including a turret controller coupled to the plurality of actuators, the turret controller being configured to receive an operator input from the operator interface and to control subsequent movement of the turret according to a stored profile selected in accordance with the operator input.

2. (Original) The vehicle according to claim 1, wherein the stored profile is one of a plurality of stored profiles including a turret pan profile, a turret deploy profile, and a turret pan profile, and wherein the operator interface is configured to permit the operator to select each of the turret pan profile, the turret deploy profile, and the turret pan profile at different times of turret operation.

3. (Original) The vehicle according to claim 1,

wherein the stored profile is a turret deploy profile, and

wherein the turret deploy profile is user-configurable by way of the operator interface.

4. (Original) The vehicle according to claim 3,

wherein the movement according to the turret deploy profile causes the turret to be moved to a deploy position, and

wherein the deploy position is user-configurable by way of the operator interface.

5. (Original) The vehicle according to claim 1, wherein the stored profile is a turret pan profile, and wherein the turret pan profile is user configurable.

6. (Original) The vehicle according to claim 5, wherein the operator interface is configured to permit the operator to specify an oscillate range for the turret pan profile.

7. (Original) The vehicle according to claim 6, wherein the operator interface is configured to provide visual feedback regarding the specified oscillate range.

8. (Original) The vehicle according to claim 7, wherein the visual feedback is provided using a display bar having a length that is determined by the specified oscillate range.

9. (Original) The vehicle according to claim 8, wherein the display bar is a first display bar, and wherein the visual feedback is further provided using a second display bar having a length that determined by the specified oscillate range, the first and second display bars respectively indicating a range of oscillation to the right from center and a range of oscillation to the left from center.

10. (Original) The vehicle according to claim 1, wherein the stored profile is a turret deploy profile.

11. (Original) The vehicle according to claim 1, wherein the stored profile is a turret store profile.

12. (Original) The vehicle according to claim 1, wherein the stored profile is a turret pan profile.

13. (Original) The vehicle according to claim 1, wherein the adjustable mount assembly comprises a turret base and a plurality of articulated arms, the plurality of articulated arms being connected end-to-end between the turret base and the turret nozzle.

14. (Original) The vehicle according to claim 13, wherein the plurality of articulated arms include an adjustable length arm having an adjustable length, and wherein the turret control system comprises a sensor that measures the length of the adjustable length arm.

15. (Original) The vehicle according to claim 13, wherein the base is rotatable, and wherein the turret control system comprises a sensor that measures an angle of rotation of the base.

16. (Original) The vehicle according to claim 1, further comprising a camera mounted to turret mount assembly.

17. (Original) The vehicle according to claim 16, wherein the camera is an infrared camera.

18-19. (Cancelled)

20. (Original) A fire fighting vehicle comprising:

(A) a chassis and a vehicle body mounted on the chassis, the chassis and vehicle body in combination including an operator compartment capable of receiving a human operator, the operator compartment including steering and throttle controls for receiving operator inputs to control movement of the fire fighting vehicle along a road;

(B) a turret including

(1) an adjustable mount assembly, the adjustable mount assembly being mounted to the chassis and vehicle body combination, and the mount assembly including a fire-extinguishing agent delivery system capable of transporting a fire-extinguishing agent through the mount assembly,

(2) a turret nozzle, the turret nozzle being mounted to the adjustable mount assembly, and the turret nozzle being capable of receiving the fire-extinguishing agent from the fire-extinguishing agent delivery system;

(C) an operator interface, the operator interface being configured to receive operator inputs useable to control movement of the turret; and

(D) a turret control system, the turret control system including a plurality of actuators capable of adjusting the mount assembly to permit the position and orientation of the turret nozzle to be adjusted, the turret control system further including a turret controller coupled to the plurality of actuators, the turret controller storing position information relating to a desired position of the turret, and the turret controller being programmed to control movement of the turret in accordance with the position information and the operator inputs from the operator interface.

21-24. (Cancelled)

25. (Original) The vehicle according to claim 20, wherein the operator inputs comprise an indication that the operator wishes the turret to be deployed, and wherein the turret controller controls the movement of the turret to deploy the turret in accordance with the position information.

26. (Original) The vehicle according to claim 20, wherein the operator inputs comprise an indication that the operator wishes the turret to move in accordance with a predetermined pattern represented by the position information, and wherein the turret controller controls the movement of the turret in accordance with the predetermined pattern.

27. (Original) The vehicle according to claim 20, wherein the operator inputs comprise an indication that the operator wishes the turret to be stored at a store location, and wherein the turret controller controls the movement of the turret to move the turret to the store location in accordance with the position information.

28. (Original) The vehicle according to claim 20, wherein the operator interface comprises a display capable of displaying graphics.

29. (Original) The vehicle according to claim 28, wherein the vehicle further comprises a video camera mounted to the turret, and wherein the display is configured to display I/O status information relating to operation of the turret simultaneously with video data from the video camera.

30. (Original) The vehicle according to claim 20, wherein the vehicle further comprises an imaging device mounted to the turret.

31. (Original) The vehicle according to claim 30, wherein the turret controller is configured to control movement of the turret in accordance with information received from the imaging device.

32. (Original) The vehicle according to claim 31, wherein the imaging device is an infrared camera.

33. (Original) The vehicle according to claim 31, wherein the imaging device is a laser detection device.

34. (Original) The vehicle according to claim 20,
wherein the turret is a first turret, the adjustable mount assembly is a first adjustable mount assembly, and the turret nozzle is a first turret nozzle;

wherein the vehicle further comprises a second turret including
(1) a second adjustable mount assembly, the second adjustable mount assembly being mounted to the chassis and vehicle body combination, and the second mount assembly including a fire-extinguishing agent delivery system capable of transporting a fire-extinguishing agent through the second mount assembly,

(2) a second turret nozzle, the second turret nozzle being mounted to the second mount assembly, and the second turret nozzle being capable of receiving the fire-extinguishing agent from the fire-extinguishing agent delivery system; and

wherein the operator interface is configured to receive information pertaining to the position and orientation of the first and second turrets, wherein the operator interface comprises a display, and wherein the operator interface is configured to provide feedback information via the display pertaining to the position and orientation of the first turret and the position and orientation of the second turret.

35. (Original) The vehicle according to claim 34, wherein the display is capable of displaying graphics, and wherein the feedback information is provided by a rendering on the display of the position and orientation of the first turret and by a rendering on the display of the position and orientation of the second turret.

36. (Original) The vehicle according to claim 34, wherein the feedback information pertaining to the position and orientation of the first turret is displayed simultaneously with the feedback information pertaining to the position and orientation of the second turret.

37. (Original) The vehicle according to claim 34, wherein the feedback information pertaining to the position and orientation of the first turret and the feedback information pertaining to the position and orientation of the second turret are displayed separately on separate display screens of the display.

38. (Original) The vehicle according to claim 20, wherein the vehicle further comprises a power distribution and control system, the power distribution and control system further including

a power source,

a power transmission link,

a plurality of output devices, the plurality of output devices including a plurality of actuators capable of adjusting the mount assembly to adjust the position and orientation of the turret nozzle,

a plurality of input devices, the plurality of input devices including a plurality of position sensors capable of providing position information pertaining to the position and orientation of the nozzle, and the plurality of input devices further including an input device associated with an operator interface,

a communication network,

a plurality of interface modules; the plurality of interface modules being coupled to the power source by way of the power transmission link, the plurality of interface modules being interconnected to each other by way of the communication network, and the

plurality of interface modules being coupled to the plurality of input devices and to the plurality of output devices by way of respective dedicated communication links, and the plurality of interface modules including one or more interface modules that are coupled to the plurality of position sensors, the plurality of actuators, and the input device associated with an operator interface; and

wherein the turret controller comprises at least one of the plurality of interface modules.

39. (Original) The vehicle according to claim 38, wherein the operator interface comprises a display capable of displaying graphics, wherein the vehicle further comprises a video camera mounted to the turret, and wherein the display is configured to display I/O status information relating to operation of the turret and obtained from the plurality of interface modules simultaneously with video data from the video camera.

40. (Original) The vehicle according to claim 39, wherein the video data is communicated by way of the communication network.

41. (Original) The vehicle according to claim 38, wherein the plurality of output devices include an electric motor and wherein the plurality interface modules comprise an interface module coupled to drive the electric motor.

42. (Original) The vehicle according to claim 41, wherein the interface coupled to drive the electric motor produces a pulse-width modulated output signal.

43. (Original) The vehicle according to claim 38,

wherein each of the plurality of position sensors is configured to measure movement about a respective axis,

wherein the plurality of input devices further comprise a plurality of pairs of limit switches respectively associated with the plurality of position sensors and configured to

ascertain whether the turret has reached a boundary of movement about the axis measured by the respective position sensor,

wherein the plurality of input devices including a plurality of position sensors capable of providing position information pertaining to the position and orientation of the nozzle, and the plurality of input devices further including an input device associated with an operator interface,

wherein the turret controller comprises calibration logic configured to calibrate a respective one of the plurality of position sensors and the associated pair of limit switches based on operation of the other of the respective one of the plurality of position sensors and the associated pair of limit switches.

44. (Original) The vehicle according to claim 38,

wherein the plurality of interface modules, the plurality of input devices, and the plurality of output devices are distributed throughout the fire fighting vehicle; and

wherein each respective interface module is locally disposed with respect to the respective input and output devices to which the respective interface module is coupled so as to permit distributed data collection from the plurality of input devices and distributed power distribution to the plurality of output devices.

45-47. (Cancelled)

48. (Original) The vehicle according to claim 20, wherein the adjustable mount assembly comprises an articulated boom assembly formed of a plurality of articulated arms, wherein the vehicle further comprises a plurality of position sensors mounted to measure angles between the plurality of articulated arms, wherein the turret controller is coupled to maintain the nozzle in a predetermined horizontal orientation.

49. (Original) The vehicle according to claim 48, wherein at least one of the plurality of position sensors comprises a potentiometer.

50. (Original) The vehicle according to claim 20, wherein the adjustable mount assembly comprises an articulated boom assembly formed of a plurality of articulated arms, wherein the vehicle further comprises a plurality of position sensors mounted to measure angles between the plurality of articulated arms, wherein the turret controller is coupled to receive inputs from the plurality of position sensors, and wherein the turret controller is programmed to perform geometric calculations to ensure that the angles between the plurality of articulated arms sum to a value which causes the nozzle to maintain a predetermined horizontal orientation.

51. (Original) The vehicle according to claim 50, wherein the horizontal orientation is parallel to the chassis of the vehicle.

52. (Cancelled)

53. (Original) The vehicle according to claim 20,

wherein the turret controller is programmed to acquire operator inputs, the operator inputs being useable to generate first control signals to control motion of the turret, the operator inputs directing movement of the turret in such a way that the turret is susceptible to impacting the fire fighting vehicle; and

wherein the turret controller comprises comprising an envelope control module programmed to prevent the turret from impacting the fire fighting vehicle, including

(1) determine that the turret is susceptible to impacting the fire fighting vehicle, and in response

(2) provide the turret with second control signals that are different than the first control signals, the second control signals directing movement of the turret in such a way that the turret does not impact the fire fighting vehicle.

54. (Original) The vehicle according to claim 53, wherein the operator interface comprises an operator override input device, the turret controller being configured to process an input from the operator override input device to override the envelope control module to permit the operator to continue to operate the turret outside of a permissible travel envelope.